

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

Please amend claim 1 and cancel claims 23-34 without prejudice. Please add the following new claims 47-58.

LISTING OF THE CLAIMS

1. (Currently Amended) A process for the lost pattern casting of metals, said process comprising the steps of:
 - forming a pattern from a material;
 - forming an erodable coating around at least a portion of said pattern to form a mold, said coating comprising a particulate material and a binder;
 - removing said pattern from said mold;
 - delivering molten metal into said mold;
 - ~~contacting said mold with a solvent;~~
 - cooling said molten metal such that it only partially solidifies into a casting;and
 - removing at least a part of said mold with a solvent while the casting is partially solidified.
2. (Original) A process according to claim 1, wherein said material for forming said pattern comprises foam.
3. (Original) A process according to claim 1, wherein said step of delivering a molten metal into said mold and said step of removing said pattern from said mold occur approximately simultaneously.
4. (Original) A process according to claim 1, further comprising the step of forming an erodable backing around at least a portion of said erodable coating, said erodable backing comprising a particulate material and a binder.

5. (Original) A process according to claim 4, further comprising the steps of:
contacting said erodable backing with a solvent; and
removing at least a part of said erodable backing.
6. (Original) A process according to claim 4, wherein a weight percent of said binder in said erodable coating is greater than a weight percent of said binder in said erodable backing.
7. (Previously Presented) An apparatus according to claim 36, wherein said aggregate comprises a material of low heat diffusivity selected from the group consisting of cenospheres; crushed pumice particles; silica sand; ceramic, glass and refractory microbubbles; perlite; and mixtures thereof.
8. (Previously Presented) An apparatus according to claim 36, wherein said binder comprises a component selected from the group consisting of phosphate glass, inorganic silicates, borates, phosphates, sulfates, organic binders, and mixtures thereof.
9. (Original) A process according to claim 1, wherein said step of forming an erodable coating around at least a portion of said pattern to form a mold is performed by dipping said pattern into a slurry comprising said coating.
10. (Original) A process according to claim 1, further comprising the step of attaching a gate to said pattern.
11. (Original) A process according to claim 10, wherein the step of delivering molten metal into said mold is performed by delivering molten metal through said gate.
12. (Previously Presented) An apparatus according to claim 36, wherein said binder is free of water and hydrocarbons.

13. (Original) A process according to claim 1, wherein said binder is soluble in said solvent.
14. (Original) A process according to claim 1, wherein said solvent comprises water.
15. (Original) A process according to claim 1, wherein said step of contacting said mold with a solvent comprises the step of spraying the solvent.
16. (Original) A process according to claim 1, wherein said mold is permeable to said solvent.
17. (Original) A process according to claim 1, wherein said step of contacting said mold with a solvent comprises the step of delivering the solvent to said mold in an amount of from 0.5 to 50 liters per second and at a pressure from 0.03 to 70 bar.
18. (Original) A process according to claim 1, wherein said solvent contains at least one of a grit and a surfactant.
19. (Original) A process according to claim 1, wherein the steps of removing at least a portion of said mold and cooling the molten metal are performed approximately simultaneously.
20. (Original) A process according to claim 1, wherein said step of cooling comprises contacting a shell of solidifying metal around said molten metal with said solvent.
21. (Original) A process according to claim 1, wherein said step of cooling comprises the step of using an already cooled portion of the casting as a chill to remove heat from a still molten portion of the casting.
22. (Original) A process according to claim 1, wherein said steps of (i) contacting said mold with a solvent; (ii) cooling said molten metal such that it at least partially

solidifies to form a casting; and (iii) removing at least a part of said mold; are performed by lowering said mold into a bath of said solvent.

23-34 (Cancelled)

35. (Previously Presented) An apparatus for the lost pattern casting of metals whereby a lost pattern mold is at least partially eroded and a molten metal in the mold is cooled and solidified by contact with a solvent to form a casting, said apparatus comprising:

an erodable lost pattern mold;

an erodable backing at least partially surrounding and supporting said mold;

and

a nozzle for delivering a solvent to contact at least a part of said mold and said backing, the solvent eroding at least a part of said mold and said backing before the molten metal is fully solidified.

36. (Original) An apparatus according to claim 35, wherein said mold comprises an aggregate and a binder.

37. (Original) An apparatus according to claim 35, wherein said backing comprises an aggregate and a binder.

38. (Original) An apparatus according to claim 35, wherein said nozzle is configured to deliver said solvent in an amount of from 0.5 to 50 liters per second and at a pressure from 0.03 to 70 bar.

39. (Original) An apparatus according to claim 35, comprising a plurality of nozzles.

40. (Original) An apparatus according to claim 39, wherein said plurality of nozzles deliver two or more different solvents.

41. (Original) An apparatus according to claim 39, wherein said plurality of nozzles

deliver solvent at two or more different temperatures, pressures or rates.

42. (Original) An apparatus according to claim 35, wherein said nozzle is configured to deliver solvent at a pressure and rate such that a shell of solidifying metal is formed around a metal casting in said mold prior to said solvent contacting said casting.
43. (Original) An apparatus according to claim 35, wherein said nozzle is configured to deliver solvent beginning at a base of said mold and progressing to a top of said mold.
44. (Previously Presented) A process for the lost pattern casting of metals, said process comprising the steps of:
 - forming a pattern from a material;
 - forming a coating around at least a portion of said pattern to form a mold;
 - forming a backing around at least a portion of said mold;
 - removing said pattern from said mold;
 - delivering molten metal into said mold;
 - cooling said molten metal such that it partially solidifies to form a partially solidified casting,
 - contacting said backing and said mold with a solvent to decompose at least a part of said backing and at least a part of said mold; and
 - contacting the casting with solvent to further solidify the casting.
45. (Previously Presented) A process according to claim 44, wherein said steps of (i) contacting said backing with a solvent to decompose at least a part of said backing; and (ii) cooling said molten metal such that it at least partially solidifies to form a partially solidified casting; are performed by lowering said mold into a bath of said solvent.
46. (Previously Presented) A process according to claim 44 wherein the molten metal comprises aluminum and the solvent comprises water.

47. (New) A process for the lost pattern casting of metals, said process comprising the steps of:
- forming a pattern from a material;
 - forming an erodable coating around at least a portion of said pattern to form a mold, said coating comprising a particulate material and a binder;
 - delivering molten metal into said mold;
 - directing a fluid stream at the mold when a casting in the mold is partially solidified; and,
 - dislodging at least a portion of the mold from the casting.
48. (New) A process according to claim 47 further comprising removing said pattern from said mold and wherein said step of delivering a molten metal into said mold and said step of removing said pattern from said mold occur approximately simultaneously.
49. (New) A process according to claim 47 further comprising the step of forming an erodable backing around at least a portion of said erodable coating, said erodable backing comprising a particulate material and a binder.
50. (New) A process according to claim 49 further comprising the steps of contacting said erodable backing with the fluid stream and removing at least a part of said erodable backing.
51. (New) A process according to claim 47 further comprising the step of attaching a gate to said pattern.
52. (New) A process according to claim 51 wherein said step of delivering molten metal into said mold is performed by delivering molten metal through said gate.
53. (New) A process according to claim 47 wherein said step of directing a fluid stream at the mold comprises the step of spraying a solvent at the mold.

54. (New) A process according to claim 53 further comprising the step of permeating said mold with said solvent.
55. (New) The process of claim 53 wherein said solvent is sprayed at the mold in an amount of from 0.5 to 50 liters per second and at a pressure from 0.03 to 70 bar.
56. (New) The process of claim 47 further comprising the step of cooling said molten metal in said mold.
57. (New) The process of claim 56 wherein said step of cooling comprises contacting a shell of solidifying metal around said molten metal with said fluid stream.
58. (New) The process of claim 57 wherein said step of cooling comprises the step of using an already cooled portion of the casting as a chill to remove heat from a still molten portion of the casting.